

Remarks

Reconsideration and reexamination of the above-identified patent application are respectfully requested. Independent claims 18 and 20 are pending in this application.

Claim Rejections - 35 U.S.C. § 103

In the final Office Action mailed on July 14, 2003, the Examiner rejected claims 18 and 20 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,576,724 issued to Fukatsu et al. ("Fukatsu") and JP 2-227340 issued to Kadomuki et al. ("Kadomuki"). The Applicant respectfully traverses this rejection and believes that the claimed invention as recited in independent claims 18 and 20 are patentable over any combination of Fukatsu and Kadomuki.

1. Background of the Claimed Invention

As described on page 1, lines 1-17 of the Applicant's specification, a HUD is directed onto the windshield of a vehicle in order to display information for a vehicle operator. Information typically displayed by the HUD is the speed of the vehicle. As the HUD is displayed onto the vehicle windshield, the background of the HUD includes the oncoming surroundings of the vehicle. For instance, the background of the HUD includes the road, trees, sky, other vehicles, etc., ahead of the vehicle, i.e., the background of the HUD is the scene viewed by the vehicle operator as the vehicle operator looks through the windshield ahead of the vehicle.

In some situations, there may be an arrangement of environmental factors in the background that make the HUD difficult for the vehicle operator to see or distinguish from the background. For example, the visibility of the HUD be affected by a background produced by a gravel road (34) (FIG. 3A) or elongated crops (42) (FIG. 3B). As such, if the HUD is

formed with the same or similar fill pattern as the pattern of the background, then the HUD may be difficult for the vehicle operator to view.

2. The Claimed Invention

The claimed invention, as recited in independent claims 18 and 20, is a vehicle display system and method which provide a HUD onto a windshield of a moving vehicle. A control arrangement controls the contrast of the HUD relative to an environmental image approaching the moving vehicle. To this end, the control arrangement captures the environmental image approaching the moving vehicle, determines texture or structural features of the environmental image, and controls the contrast of the HUD in response to the texture of the environmental image approaching the moving vehicle. Specifically, the control arrangement selects an appropriate fill pattern for the HUD dependent upon the texture or structural features of the environmental image in order to contrast the HUD relative to the environmental image.

Independent claim 18 recites that a fill pattern for the HUD is selected dependent upon the determined texture (or structural features as recited in independent claim 20) of the environmental image in order to contrast the HUD relative to the environmental image. Support for these limitations is found on FIGS. 3A and 3B; and page 2, lines 1-5 and lines 10-18; page 4, lines 7-13; and page 4, line 20 through page 5, line 6; page 5, line 16 through page 6, line 7 of the Applicant's specification.

As such, the claimed invention compensates for texture and structural features of the environmental image in order to improve the contrast of the HUD relative to the environmental image by controlling the fill pattern of the HUD dependent upon the texture or structural features of the environmental image. For example, in the case of a gravel road environmental image (34), the fill pattern of the HUD may be selected to be elongated bars (36) in order to improve the clarity of the HUD relative to the gravel road. Similarly, in the case of an elongated crop environmental image (42), the fill pattern of the HUD may be

selected to be dots (44) in order to improve the clarity of the HUD relative to the elongated crops.

3. Fukatsu and Kadomuki

In the final Office Action, the Examiner posited that Fukatsu teaches the claimed invention with the exception of failing to teach that the control arrangement selects an appropriate fill pattern for the HUD dependent upon the texture of the environmental image in order to contrast the HUD relative to the environmental image. The Examiner posited that Kadomuki teaches a HUD including the symbol (B) for selecting an appropriate fill pattern (citing figs. 2-5 and pages 9-10) for the HUD dependent upon the landscape, the trees, and the road information in order to contrast sufficiently between the respective colors of the landscape, the trees, and the road information relative to a background (citing figs. 7-8 and 10; and page 13, line 17 through pages 14-15). As described in more detail below, the Applicant respectfully traverses the Examiner's position regarding the teachings of Kadomuki.

4. The Claimed Invention Compared to Fukatsu and Kadomuki

The claimed invention generally differs from any combination of Fukatsu and Kadomuki in that the control arrangement selects a fill pattern for the HUD dependent upon texture or structural features of the environmental image in order to contrast the HUD relative to the environmental image (see FIGS. 3A and 3B). As such, the claimed invention controls the contrast of the HUD relative to the texture and structural features of the environmental image by selecting a fill pattern for the HUD which contrasts to the texture and structural features. Neither Fukatsu nor Kadomuki teach or suggest selecting a fill pattern for the HUD dependent upon the texture or structural features of the environmental image in order to contrast the HUD relative to the environmental image.

Specifically, Kadomuki does not teach or suggest selecting a fill pattern for a HUD which contrasts to the texture and structural features of an environmental image.

Kadomuki generally teaches changing the method for displaying an information symbol (i.e., the HUD) in accordance with status of the observed forward field (i.e., the environmental image) so that the HUD can be identified by an operator regardless of the observed forward field status. See pages 2-8 of Kadomuki.)

Fig. 2 and pages 9-10 of Kadomuki teach changing the display position of the symbol in the case where the color of the symbol is similar to the color of the portion of the forward field of vision that constitutes a background for the symbol. See also "(C): Symbol display position shift direction" in Fig. 2.

Fig. 3 and pages 10-11 of Kadomuki teach changing the color of the symbol in the case where the color of the symbol is similar to the color of the portion of the forward field of vision that constitutes a background for the symbol. See also "(C): Symbol color change" in Fig. 3.

Fig. 4 and page 11 of Kadomuki teach changing the display position of the symbol in the case where the brightness of the symbol is similar to the brightness of the portion of the forward field of vision that constitutes a background for the symbol. See also "(C): Symbol display position shift direction" in Fig. 4.

Fig. 5 and pages 11-12 of Kadomuki teach changing the brightness of the symbol in the case where the brightness of the symbol is similar to the brightness of the portion of the forward field of vision that constitutes a background for the symbol. See also "(C): Symbol brightness change" in Fig. 5.

Figs. 6-10 and pages 13-15 of Kadomuki teach accurately positioning a symbol (such as symbols A, B, and C) on the forward field of vision as the forward field of vision changes due to vehicle movement.

In contrast to controlling the display position, color, or brightness of an HUD dependent upon the color or brightness of a background environmental image, the claimed invention controls the fill pattern of the HUD dependent upon determined texture or structural features of the environmental image.

As such, as opposed to determining the color or brightness of an environmental image as disclosed by Kadomuki, the claimed invention determines the texture or structural features of the environmental image. The word “texture” is defined at www.dictionary.com as being “the distinctive physical composition or structure of something, especially with respect to the size, shape, and arrangement of parts.” The word “structure” is defined at www.dictionary.com as being “something made up of a number of parts that are held or put together in a particular way.” These definitions comport with the above-mentioned gravel road and elongated crops examples disclosed by the Applicant. Again, Kadomuki does not teach or suggest determining the texture or structural features of an environmental image as disclosed and claimed.

Further, as opposed to controlling the display position, color, or brightness of a HUD in order to control the contrast of the HUD relative to an environmental image as disclosed by Kadomuki, the claimed invention selects a fill pattern for the HUD dependent upon the texture or structural features of the environmental image in order to control the contrast of the HUD relative to the environmental image. The word “pattern” is defined at www.dictionary.com as being a “consistent, characteristic form, style, or method, as: a composite of traits or features characteristic of an individual or a group.” This definition comports with the above-mentioned gravel road and elongated crops environmental image examples in which the fill patterns for the HUD are elongated bars and dots, respectively. Again, Kadomuki does not teach or suggest controlling the contrast of a HUD by selecting a fill pattern for the HUD as disclosed and claimed.

In view of the foregoing remarks, the Applicant believes that independent claims 18 and 20 patentably distinguish over any combination of Fukatsu and Kadomuki. Therefore,

the Applicant respectfully requests reconsideration and withdrawal of the rejection to the claims under 35 U.S.C. § 103(a).

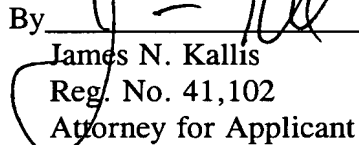
CONCLUSION

In summary, claims 18 and 20 meet the substantive requirements for patentability. The case is in appropriate condition for allowance. Accordingly, such action is respectfully requested.

If a telephone or video conference would expedite allowance or resolve any further questions, such a conference is invited at the convenience of the Examiner.

Respectfully submitted,

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Date: July 22, 2003

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